What is claimed is:

1. A motor vehicle comprising:

an air storage tank mounted on the motor vehicle;

a drive train including a transmission and an internal combustion engine having a plurality of cylinders, an exhaust pipe from each cylinder and a crank shaft for turning the a transmission;

a multi-stage compressor including at least a first cylinder of the internal combustion engine as a low pressure compression stage and an outlet connected to supply high pressure air to the air storage tank;

a controllable discharge valve from the air storage tank; and

pressurized air utilization means connected to the controllable discharge valve and responsive to compressed air for boosting output of the drive train.

2. A motor vehicle as set forth in claim 1, further comprising:

a controller area network;

an engine controller communicating with the controller area network and for determining engine load and engine torque capacity information and for implementing engine compression braking and split mode operation of the engine;

a braking system for retarding vehicle velocity including through requests for engine compression braking placed on the controller area network;

a pressure sensor associated with the high pressure fluid storage tank for generating pressure signals for the engine controller; and

the engine controller being further responsive to a first minimum pressure sensor reading below the maximum allowed pressure for initiating operation of the multi-stage compressor during engine compression braking and still further responsive to pressure sensor readings below a second greater minimum threshold for initiating split mode operation engine and concurrently initiating operation of the multi-stage compressor during periods when the engine has excess capacity.

3. A motor vehicle as set forth in claim 2, wherein the means for boosting comprises a compressed air powered hydrostatic motor coupled to the transmission.

4. A motor vehicle as set forth in claim 2, wherein the means for boosting comprises a power turbine coupled to the crankshaft.

5. A motor vehicle as set forth in claim 2, wherein the means for boosting comprises:

a supercharger having an exhaust driven power turbine; and

an intake manifold for the internal combustion engine coupled for boost to the supercharger.

6. A motor vehicle as set forth in claim 1, further comprising:

a pressure sensor for the air storage tank;

means for determining load on the internal combustion engine;

means responsive to a negative load on the internal combustion engine and a first pressure level reading below a maximum allowed level for the air storage tank for initiating operation of the first pressure amplifier; and

means responsive to a non-negative load on the internal combustion engine leaving load capacity and a second lower under pressure level reading for the air storage tank for initiating split mode operation of the internal combustion engine and operation of the first pressure amplifier.

7. A motor vehicle as set forth in claim 6, further comprising:

a torque request input; and

means responsive to a request for torque and an air pressure reading from the pressure sensor exceeding a boost threshold minimum for opening the discharge valve to the means for boosting.

8. A motor vehicle as set forth in claim 6, wherein a negative load on the internal combustion engine is indicated by a brake pedal position sensor signals.

9. A vehicle comprising:

a drive train including a transmission and an engine having a plurality of cylinders, of which one or more can be operated as non-firing air pump stages, and an output shaft;

exhaust pipes from the cylinders;

a shutter valve located in the exhaust pipe for at least one cylinder which can be diverted to operation as an air pump stage, the shutter valve being positionable to retard exhaust venting from the cylinder;

a fluid amplifier having an input communicating with the exhaust pipe between the cylinder and the shutter valve to operate as second stage high compression fluid pump;

a high pressure storage tank connected to the fluid amplifier to receive compressed fluid; and

a drive train booster connected to the high pressure storage tank to receive compressed fluid.

10. A motor vehicle as set forth in claim 9, further comprising:

a controller area network;

an auxiliary controller communicating with the controller area network generating a vehicle speed signal;

an engine controller communicating with the controller area network providing engine load and engine torque capacity information and for implementing engine compression braking and split mode operation of the engine;

a braking system for retarding vehicle velocity including through requests for engine compression braking placed on the controller area network;

a pressure sensor associated with the high pressure fluid storage tank for generating pressure signals and placing the signals on the controller area network; and

the engine controller being further responsive to pressure sensor readings below the maximum allowed pressure for operating the shutter valve to cause the fluid amplifier to pump fluid into the high pressure storage

tank during engine compression braking and still further responsive to pressure sensor readings below a second greater minimum threshold for initiating split mode operation of the engine and concurrently operating the shutter valve to actuate the fluid amplifier to pump fluid into the high pressure storage tank when internal combustion engine capacity is available.

11. A motor vehicle as set forth in claim 10, further comprising:

a body controller for generating requests for torque from the internal combustion engine;

a boost valve actuated by an engine controller for providing pressurized fluid from the high pressure tank to the drive train booster; and

the engine controller being responsive to high transient torque requests and available pressure in the high pressure storage tank for opening the boost valve.

12. A motor vehicle as set forth in claim 11, wherein the booster is a hydraulic motor coupled to drive an automatic or semi-automatic transmission.

13. A motor vehicle as set forth in claim 11, wherein the booster is a power turbine coupled to supply torque to an engine output shaft.

14. A motor vehicle as set forth in claim 11, wherein the booster is a turbo-supercharger.

15. A kinetic energy recovery system for a vehicle, comprising:

an internal combustion engine having a plurality of combustion cylinders and exhaust ports from the combustion cylinders;

a vehicle drive train connected to the internal combustion engine as its prime mover;

a multi-stage air compression system;

one or more cylinders of the internal combustion engine being available as primary stages in the multi-stage air compression system;

a high pressure stage for each low pressure stage in the multi-stage compression system;

compressed air storage coupled to receive air from the high pressure stage;

a compressed air operated drive train booster coupled by a pressure regulating valve to the compressed air storage;

a controller area network;

sensors distributed about the vehicle providing vehicle information for distribution on the controller area network; and

a vehicle management system coupled to receive information on the controller area network and responsive thereto for coordinating operation of the multi-stage air compression system, the compressed air storage and the drive train booster.

16. A kinetic energy recovery system for a vehicle as set forth in Claim 15, the vehicle management system further comprising:

a plurality of controllers including a body controller and an engine controller.